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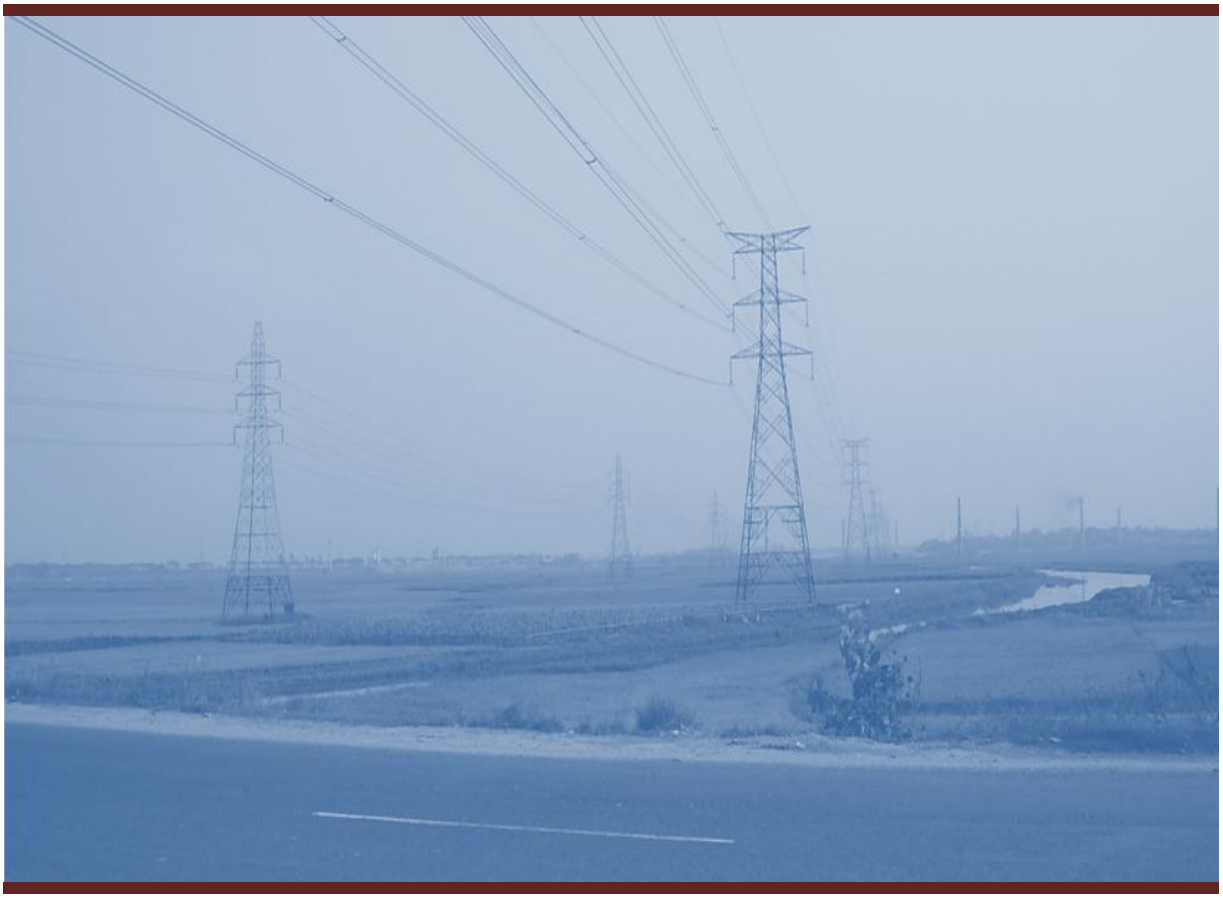
Environmental & Social Policy & Procedures (ESPP)



Assam Electricity Grid Corporation Limited (AEGCL)

&

Assam Power Distribution Company Limited (APDCL)

March 2015

Executive Summary

Abbreviations

ADB	:	Asian Development Bank
ADCs	:	Autonomous District Councils
AEGCL	:	Assam Electricity Grid Corporation Ltd
APGCL	:	Assam Power Generation Corporation Ltd.
APDCL	:	Assam Power Distribution Company Ltd
ASEB	:	Assam Electricity Board
BoD	:	Board of Directors
CA	:	Compensatory Afforestation
CBD	:	Convention on Biological Diversity
CEA	:	Central Electricity Authority
CEM	:	Chief Executive Member
CF	:	Conservator of Forests
CKM	:	Circuit Kilometers
CPCB	:	Central Pollution Control Board
CPTD	:	Compensation Plan for Temporary Damages
CSGS	:	Central Sector Generation Scheme
DFO	:	Divisional Forest Officer
DL	:	Distribution Line
DPR	:	Detail Project Report
EA	:	Environmental Assessment
EAMP	:	Environment Assessment Management Plan
E & F	:	Environment & Forests
E&S	:	Environmental and Social
EMF	:	Electro Magnetic Fields
EPA	:	Environment Protection Act
ESMP	:	Environmental and Social Management Plan
ESMC	:	Environmental and Social Management Cell
ESPP	:	Environmental and Social Policy Procedures
FEAR	:	Final Environmental Assessment Report
GDP	:	Gross Domestic Product
GHG	:	Green House Gas
GoA	:	Government of Assam
GRC	:	Grievance Redressal Committee
HT	:	High Tension
IEAR	:	Initial Environmental Assessment Report
kV	:	Kilo-volt

kWh	:	Kilo-watt hour
LT	:	Low Tension
MDONER	:	Ministry of Development of North Eastern Region
MoEF	:	Ministry of Environment& Forests
MU	:	Million Units
MVA	:	Million Volt Amperes
MW	:	Mega Watts
NBWL	:	National Board for Wildlife
NE	:	North East
NEC	:	North Eastern Council
NO	:	Nodal Officer
NOC	:	No Objection Certificate
NPV	:	Net Present Value
NSDP	:	Net State Domestic Product
OP	:	Operational Policy
O & M	:	Operation & Maintenance
PCB	:	Polychlorinated Biphenyl
PCCF	:	Principal Chief Conservator of Forests
PMU	:	Project Management Unit
RFCTLARRA	:	The Right to Fair Compensation and Transparency in Land Acquisition Rehabilitation and Resettlement Act, 2013
R & R	:	Rehabilitation & Resettlement
RoW	:	Right of Way
SIA	:	Social Impact Assessment
SF6	:	Sulfur Hexafluoride
SIMP	:	Social Impact Assessment and Management Plan
SMF	:	Social Management Framework
SPCB	:	State Pollution Control Board
T&D	:	Transmission and Distribution
TL	:	Transmission Line
TPDP	:	Tribal People Development Plan
WB	:	World Bank

EXECUTIVE SUMMARY

1 India's North East Region (NER) stretches across the eastern foothills of the Himalayan mountain range and is comprised of seven states including Assam, Manipur, Meghalaya, Mizoram, Nagaland, and Tripura. Geographically the region is connected to the other parts of the country through a small "chicken neck" corridor in the State of West Bengal. With a total population of 45.6 million (2011 census), the sparsely populated NER accounts for about 3.7 percent of India's total population and covers 7.9 percent of India's total geographical area. The vast majority of the region's population lives in rural areas, accounting for 82 percent of the total population as against compared to the national average of 69 percent (2011). A large part of the NER is hilly and, recognized as one of the globe's biodiversity hotspots. Forests cover over 2/3rd of the area, twice exceeding the policy target of 33%. This sparsely populated region is characterized by extraordinary ethnic, cultural, religious and linguistic diversity, with more than 160 Scheduled Tribes (out of 630 in the country) comprising over 400 distinct sub tribal groups, and a large and diverse non-tribal population as well.

2 **Regional Power Transmission and Distribution**. The North Eastern Region (NER) in India is endowed with rich energy resources but faces significant bottlenecks in electricity access and availability levels. The per capita power consumption in NER is one-third of the national average. The region has a shortfall of about 500 MW installed capacity against peak demand of about 1950 MW. No significant generation capacity has been added in the recent past. Therefore, inadequate power supply continues a critical constraint to sustainable growth and economic development in the NER. Some states are generally not able to draw even their allocated share of power from the Central Generating Stations (CGS) through the grid due to poor/ inadequate intra/ interstate transmission and distribution network and no capacity addition towards transmission/distribution power system not done due to fund constraints. The transmission and distribution (T&D) losses are also drastically high (up to 50%) across most of the States as a large number of remote hilly areas are connected through long low tension lines, resulting in low voltages and poor quality of power at consumer end. While generation capacity addition of about 4000 MW program over present installed capacity is already underway, adequate transmission and distribution infrastructure to transmit and distribute this power to consumers within the North-Eastern States is the need of the day.

Project Context

3 In order to create/ augment proper infrastructure of T&D in NER. Government of India (GoI) has formulated a "Composite scheme for transmission and distribution (T&D) in NER" capable of delivering adequate power to most consumers with reliability, aiming to improve the inter-state and

intra-state transmission and sub-transmission infrastructure and reduce system losses in all the NER states. The Govt. of India (GoI) has approached the World Bank to provide US$ 1500 million of IBRD funding support to portion of the scheme **"NER Power System Improvement Project (NERPSIP)"** in three investment tranches each being US$ 500 million for strengthening, augmentation of the intra-state and interstate transmission and distribution schemes (33kV and above and above) and undertake capacity building initiatives across six NER States of Assam, Manipur, Mizoram, Meghalaya, Tripura and Nagaland for World Bank & GoI funding. Ministry of Power (MoP), GoI has appointed POWERGRID, as the Central Implementing Agency (IA) to the six North East States for the Project. However, the ownership of the assets shall be with the respective State Governments/ State Utilities, which upon progressive commissioning shall be handed over to them for taking care of Operation and Maintenance of Assets at their own cost.

4 The project's first investment tranche would be implemented over a seven year period (2014-2021) and has two major components, namely:

a) Priority investments for strengthening of intra-state transmission and distribution systems;
b) Technical Assistance for Institutional Strengthening and Capacity Building of power utilities and departments.

5 In the above background, Assam state, one of the states in NER, is contemplating major expansion and augmentation of its transmission & distribution network in near future by implementing projects with the help/grant from GoI and other Multilateral Funding Agencies like the World Bank and ADB. Given the unique socio-economic, cultural and environmental resources, Assam Electricity Grid Corporation Ltd (AEGCL) and Assam Power Generation Corporation Ltd. (APDCL) in Assam is committed to manage them highly sustainably. Towards this, plans have been made by AEGCL/APDCL to prepare an Environment and Social Policy and Procedures (ESPP) to serve as a guiding instrument. AEGCL/APDCL assimilates environmental and social management procedures into its corporate functioning and also layout management procedures and protocol to address them. It outlines AEGCL/APDCL's commitment to deal with environmental and social issues relating to its transmission & distribution projects with a framework for identification, assessment and management of environmental and social concerns at both organizational as well as project levels. For this, POWERGRID, with proven credentials in management of environmental and social issues of large number of power transmission projects both within and outside the country has been mandated to prepare an ESPP for AEGCL/APDCL. Thus, it enables AEGCL/APDCL;

- To establish clear procedures and methodologies for the environmental and social screening, planning, review, approval and implementation of subprojects to be financed under the Project;

- To specify appropriate roles and responsibilities, and outline the necessary reporting procedures, for managing and monitoring environmental and social concerns related to sub-projects;
- To determine the training, capacity building and technical assistance needed to successfully implement the provisions of the ESPP;
- To ensure adequate financial provisions to meet the management measures to be undertaken to mitigate the impacts.

6 AEGCL/APDCL also believes that the ESPP is dynamic and living document, which shall be further upgraded in light of the experiences gained from field implementation and other relevant factors while mainstreaming the environmental and social concerns in its corporate functioning.

AEGCL/APDCL's Environment & Social Policy

*"AEGCL/APDCL considering the rich natural resources and diverse cultural, religious, social practice and customary laws of the region commits to achieve the goal of sustainable development and shall follow the principle of **avoidance**, **minimization** and **mitigation** during implementation of its projects with complete transparency and due social responsibility."*

7 The key principles of AEGCL/APDCL's Environmental and Social Policy are:

- Avoidance of environmentally and socially sensitive areas while planning project activities;
- Minimization of impacts when project activities occur in environmentally and socially sensitive areas;
- Mitigation of any unavoidable negative impacts arising out of its projects.

Methodology & Approach

8 The ESPP has been prepared following a region/ state specific environmental and social assessments which involved generating information through both primary and secondary sources including consultations and library research. The methodology adopted to identify the potential environment and social impacts is based on experience gained from implementation of similar projects and baseline assessments of work activities anticipated in this proposed project. The methodology takes in to account wide range of receptors:

- Physical & chemical environment (e.g. water, soil, etc.);
- Biological environment (forest, animals, birds, etc.); and
- Communities, social groups and individuals (loss of land, loss of agricultural production, tribal, vulnerable groups (women and backward classes), socio-economic condition, health and safety risks).

9 The basic approach broadly involved following:

- Review of environment & social baseline information from secondary sources;
- Review of existing national & state specific legislations and policy and guidelines of multilateral agencies;
- Review of project related documents; and
- Stakeholders' consultations.

Consultation/ Participation

10 Consultations with key stakeholders including local, state, regional, central government entities and key ministries at the state level and central level as well as with World Bank officials were undertaken to know views and concerns about environmental and social issues/ concerns of the project. This activity ensured appropriate participation and gathering views from the environment and social perspective of all the stakeholders' which is integrated in this ESPP to be adopted during different stages of the project implementation.

Assam at a Glance

11 ***Geography and Governance***. The State of Assam spreads over an area of 78,438 sq km. and lies between 89°5'- 96°1' East and 24°3'- 27°58' North. Geographically Assam and these States are connected to the rest of India via a strip of land in West Bengal called the Siliguri Corridor or "Chicken's Neck". Assam shares international borders with Bhutan and Bangladesh.

12 The State of Assam is divided into 4 divisions (namely Upper Assam, Lower Assam, North Assam and Hills and Barak Valley Division) each headed by a Commissioner. The Commissioner oversees the activities of a number of districts. The State of Assam is divided into 27 districts. To further provide regional autonomy and better status within the constitutional framework from the tribes of Assam some of the areas have been incorporated within the sixth schedule of the Constitution of India. The Sixth Schedule provides for administration of certain tribal areas as autonomous entities. There are nine such autonomous regions which have been defined in the State of Assam. The administration of autonomous councils vested in a District Council and of an autonomous region, in a Regional Council. These Councils are endowed with legislative, judicial, executive and financial powers. Six schedule areas in Assam are Bodoland Territorial Council, Karbi Anglong Autonomous Council, Dima Hasao Autonomous District Council[1].

[1] Govt. of Assam has recently created 6 more Autonomous Councils viz. Rabha Hasong Autonomous Council (RHAC), Mishing Autonomous Council (MAC), Tiwa Autonomous Council (TAG), Deori Autonomous Council (DAC), Thengal Kachari Autonomous Council (TKAC) and Sonowal Kachari Autonomous Council (SKAC).

13 ***Demography.*** The Population of Assam according to the 2011 census stands at 3,12,05,576, making it the 14th most populated State in India. The State makes up about 2.5% of the country's population. The State is spread over an area of about 78,400 sq. km. making it the 16th largest State in the country in terms of area. The density of population per sq km is about 398 and almost equal to the national average. The State has a population growth rate of about 17% which is again very close to the national growth rate. The literacy rate in the State is 72.19% (census 2011) where male and female literacy rates are 78.81% and 67.27% respectively. Sex Ratio in Assam is 958, which is above national average of 940 as per census 2011. The Scheduled Castes (SCs) and Scheduled Tribes (STs) population consists nearly 7.15% and 12.45 % of the total population in the State.

14 ***Forests and Protected Areas.*** The State of Assam is enriched with extensive forest area and also rich with different species and strains of floras and faunas along with valuable forest products. Forest cover constitutes 35.28% of total land area of this State. The recorded forest area of Assam is 26,832 sq. km. Also there are nearly 40 Sacred Groves are identified in Assam. Mostly Sacred Groves are found in Karbi Anglong district. However, some of the monasteries like Shankaradeva maths distributed all over the State also have Sacred Groves. These Sacred Groves are ecologically rich and play important role in the religious and sociocultural life of the local people and homes to many medicinal and aromatic plants. These sacred groves are protected by the community but do not have any legal protection.

15 In Assam 25 protected area networks consisting of 5 National Parks, and 20 Wildlife Sanctuaries (including 2 proposed WLS) are formed. All these National Parks and WLS hold a large number of endangered and local species (refer Table - 1). Assam has five Elephant Reserves (Sonitpur ER (1,420 sq km), Dehing-Patkai ER (937 sq km), Kaziranga-Karbi Anglong ER (3,270 sq km), Dhansiri-Lungding ER (2,740 sq km), and Chirang-Ripu ER (2,600 sq km) and Eight Elephant Corridors connects these Elephant Reserves, Protected Forest and nearby forests locating in the neighboring States.

Table - 1: Protected Area Network in Assam

Sl. No.	National Park and Wildlife Sanctuaries	Location (District)	Main Habitat
1.	Kaziranga National Park	Golaghat, Nagaon & Sonitpur	One horned Rhino, Swamp Deer, Wild Buffalo, Tiger, Elephant, Hoolock Gibbon, Capped Langur, Home to 25 globally threatened and 21 near threatened species of birds
2.	Manas National Park	Chirang and Baksa	Rhino, Elephant, Tiger, Pygmy Hog, Hispid hare, Golden Langur, Assamese Macaque, Rhesus Macaque, Leopard, Golden Cat, Fishing Cat,

Sl. No.	National Park and Wildlife Sanctuaries	Location (District)	Main Habitat
			Leopard Cat, Jungle Cat, Large Indian civet, Small Indian civet, Toddy Cat
3.	Orang National Park	Udalguri and Sonitpur	Rhino, Tiger, Maljuria Elephants (male elephants in group), Hog Deer, Wild Pig 222 species of Birds (Greater Adjutant Stork, Lesser Adjutant Stork, Brahminy Duck, Pintail Duck etc.)
4.	Nameri National Park	Sonitpur	Tiger, Leopard, Elephant, Gaur, Wild Pigs, Sambar, Barking Deer, Hispid hare, Slow Loris, Capped Langur, White Winged Wood duck, Palla's fish-eagle, Lesser Adjutant Stork, Greater spotted Eagle, White ramped vulture, Longo billed vulture, Black bellied Term, Rufous–necked Hornbill, Wreathed Hornbill, Great Pied Hornbill etc.
5.	Dibru-Saikhowa National Park	Dibrugarh and Tinsukia	Tiger, Elephant, Leopard, Jungle Cat, Bears, Small Indian Civet, Squirrels, Gangetic Dolphin, Slow Loris, Assamese Macaque, Rhesus Macaque, Capped Langur, Hoolock Gibbon. It is an identifies Important Bird Area (IBA)
6.	Bherjan-Borajan-Padumoni WLS	Tinsukia	Hoolock Gibbon, Capped Langur, Pig-tailed, Macaque, Macaque, Slow Loris and Rhesus Macaque
7.	Panidehing WLS	Sivasagar	Elephants, Lesser Adjutant Stork, Greater Adjutant, Swamp Francolin, Spot-billed Pelican, White-rumped Vulture, Greater Spotted Eagle, Slender-billed Vulture, Pallas's Fish-eagle
8.	Hollongpara Gibbon WLS	Jorhat	7 Primates (Hoolock Gibbon, Stump- tailed Macaque, Capped Langur, Pig-tailed Macaque, Assamese Macaque, Slow Loris and Rhesus Macaque)
9.	Nambor-Doigurung WLS	Golaghat	Gaur, Elephants, Hoolock Gibbon
10.	Garampani WLS	Karbi Anglong	Elephants, White-winged Duck, Lesser Adjutant Stork
11.	Nambor WLS	Karbi Anglong	Gaur , Elephants, Hoolock Gibbon
12.	East Karbi Anlong WLS	Karbi Anglong	Gaur, Elephants, Tiger, Hoolock Gibbon
13.	Marat Longri WLS	Karbi Anglong	Tigers, Leopards, Gaur, Elephants, Hoolock Gibbon
14.	Burhachapori WLS	Sonitpur	Elephants, Aquatic Birds, Tiger, Bengal Florican

Sl. No.	National Park and Wildlife Sanctuaries	Location (District)	Main Habitat
15.	Laokhowa WLS	Nagaon	Elephant, Tiger, Asiatic Wild Buffalo, Bengal Florican
16.	Pabitora WLS	Morigaon	Rhino, Leopards, Barking Deer, Lesser Adjutant, Greater Adjutant, White-bellied Heron, Greater Spotted Eagle
17.	Sonai-Rupai WLS	Sonitpur	White Winged wood duck, Elephant, Tiger, Gaur
18.	Barnadi WLS	Udalguri	Hispid Hare, Pygmy Hog, Elephants, Tiger
19.	Chakrasila WLS	Kokrajhar	Golden Langur, Gaur
20.	Dihing-Patkai WLS	Dibrugarh and Tinsukia	Hoolock Gibbon, Elephants, White Winqed wood duck, Tiqer
21.	Borail WLS	Cachar	Serow, Himalayan Black bear, Hoolock Gibbon
22.	Amchang WLS	Kamrup(Metro)	Elephant, Gaur, Leopard
23.	Deepor Beel Wildlife Sanctuary	Kamrup (Metro)	Greater Adjutant Stork, Whistling Teal, Open Billed Stork, Shoveler, Pintail, Garganey, Pheasant tail jacanas
24	North Karbi Anglong Wildlife Sanctuaries (Proposed)	Karbi Anglong	Tiger, Lesser cats, Elephant, Gaur, Sambar, Bears, Barking deer, Rhesus macaque, Hoolock gibbon, Capped langur, Slow loris
25	Bordoibam Bilmukh Bird Sanctuaries (Proposed)	Dhemaji and Lakhimpur	Kingfishers, Large whistling Teal, Lesser Adjutant Stork, Spotted Dove, Pheasant tailed Jacana, Bronze winged Jacana, Indian River Tern, Black Headed Gull, White Wagtail, Black Headed Oriole, Purple Moorhen, Openbill Stork

16 ***Power Scenario.*** The peak demand of the State is 1430 MW. The State's own generation is about 260MW out of their installed capacity of 377 MW as hydel generation (ROR i. e. Run of the Rivers) is negligible due to insufficient rainfall. The allocation of power in the State is depicted in the table below:

Sl. No.	Particulars	Capacity MW	Allotment To Assam		Remarks
			%	MW	
1	Kathalguri (AGBPP)	291	56.5	164	Gas based
2	R C Nagar (AGTPP)	84	45.6	38	Gas based
3	Ranganadi (RHEP)	405	43.3	175	Run on River
4	Loktak (NHPC)	105	29.4	31	Reservoir
5	Khangdong (KHEP)	50	56.3	28	Reservoir
6	Kopili-I (KOP-I)	200	53.5	107	Reservoir

7	Kopili-II (KOP-II)	25	52.3	13	Reservoir
8	Doyang (DHEP)	75	43.8	33	Reservoir
A	**Total CSGS- NER**	**1235**		**589**	
B	**Total CSGS- ER**			**162**	
C	**TOTAL CSGS**			**751**	
1	Lakwa TPS	157	100	157	Gas based
2	Namrup TPS	120	100	120	Gas based
3	Karbi Langpi HEP	100	100	100	Run on River
D	**APGCL TOTAL**	**377**		**377**	
E	**OTHERS**	**31**	**100**	**31**	EIPL, AOD, Champamati HEP etc.
F	**TOTAL AVAILABILITY**			**1159**	

Source: http://www.apdcl.gov.in/irj/go/km/docs/internet/ASSAM/webpage/PDF/prespower.pdf:

17 ***Power Utilities***. Assam Electricity Grid Corporation Limited (AEGCL) responsible for transmission of electricity to the distribution network of Assam could handle hardly 720 MW only in the year 2004. After 2004, on the assistance of Govt. of India and Govt. of Assam, different projects like ADB funding, NLCPR, NEC, TDF were implemented and grid capacity enhanced to handle load in the tune of 1603 MW presently. Since then, AEGCL has incorporated 4949.374 circuit kms of EHV lines and has a transformation capacity of about 4565.80 MVA from existing 54 numbers of EHV (400kV, 220kV, 132kV level) substations. AEGCL has also anticipated for additional transmission lines (around 900 Ckms) and transformation capacities (about 1300 MVA) by constructing new EHV substations (220 kV, 132kV level) and augmenting existing substations with assistance of Govt. of India and other funding resources including ADB.

18 The distribution of power is carried out by APDCL in the whole State of Assam by its three main regions or zones viz. Upper Assam, Central Assam and Lower Assam.

- APDCL- Upper Assam Region: It caters to the consumers of the districts of Golaghat, Jorhat, Sibsagar, Dibrugarh, Tinsukia, in Upper Assam. It has over 6.62 lakhs of consumers connected through 1503.5 Ckt km. of 33 kV lines and 9270.5 Ckt km. of 11 kV lines & 106 nos. of 33/11 KV substations of 896 MVA Capacity.

- APDCL- Central Assam Region: Area of operation of this zone is spread across the Districts of. Cachar, Karimganj, Hailakandi, Nagaon, Sonitpur, North Lakhimpur Dhemaji Morigaon,

N.C.Hills & Karbi Anglong. It has around 10.65 lakhs consumers distributed through 2539 Ckm of 33 KV lines and 22284.00 Ckm. of 11 KV network and 98 nos. of 33/11 KV substations with a total capacity of 814.00 MVA .

- APDCL- Lower Assam Region: This zone caters to the energy needs of the consumers of the districts located in lower Assam, namely, Kamrup, Nalbari, Barpeta, Kokrajhar, Bongaigaon, Goalpara and Darrang. It has over 11.94 Lakh consumers of different categories at present connected through 2047 Ckt km 33 kV lines and 9950 Ckt. km of 11 kV network and 105 nos. of 33/11 kV substations with a total capacity of 978.95 MVA.

19 Efforts are underway not only to bridge the gap but also ensure that adequate power is made available to enable boosting of State economy. An abstract of subprojects for the tranche-1 under expansion/augmentation of power system network in the State of Assam is presented in **Table 2**.

Table 2: Summary of subprojects in Tranche- I under NERPSIP

Sl. No.	Name of the subproject	Quantity (Nos.)	Capacity Addition (Km/MVA)	Estimated Cost (in Millions) *
1.	220/132 kV Transmission lines	11	376 km.	10824.80
2.	220/132/33kV substations (New/Augmentation/Extension)	20	1644 MVA	
3.	33 kV Distribution lines (overhead/underground)	38	479.km.	3913.20
4.	33/11kV substations (New)	16	240 MVA	

***The estimated cost includes consultancy fees, contingencies and Interest During Construction (IDC)**

Stakeholder analysis

20 Stakeholder's analysis has been undertaken to identify the issues and the concerns of various stakeholders who are supposed to be either directly or indirectly impacted/benefited or assume a position wherein they can have a significant role to influence the project. The Stakeholder's analysis has been carried out to identify existing relationship and also to understand the roles, responsibilities and relations of these stakeholders in context of shaping the environment and social issues with respect to proposed project. Accordingly, key stakeholders at different levels starting from village/panchayat level up to national level have been mapped to know their issues & expectations with respect to proposed project. The process of consultation with stakeholders involves formal and informal discussion. A wide range of issues were discussed with various stakeholders that might have environmental / social concern. Some of the key issues are listed below:

1. **Environment Issues**

- Impact on forest and biodiversity area e.g. national parks, sanctuary, biosphere reserves, etc.
- Impact due to waste (Used Oil or E-waste), oil spills, sanitation;
- Occupational health and safety during implementation , operation and maintenance phase;
- Soil erosion and slope un-stability;
- Leakage of SF_6, a the potent greenhouse gas; and
- Any other adverse environment issues.

2. Social and Institutional Issues

- Securing land for substation;
- Temporary damages to land, crops, trees or structures during construction;
- Health and Safety risk including HIV/AIDS;
- Community participation during project cycle i.e. planning, implementation and operation
- Tribal/vulnerable groups;
- Locals, Women and Inter agency participation/coordination; and
- Ethnic and cultural conflicts.

Impacts – Social

21 This section identifies the potential social impacts of the proposed projects in terms of the nature, magnitude, extent and location, timing and duration of the anticipated impacts. These impacts are both positive or negative relating to the project design stage, construction stage or the project operation and decommissioning stage.

i. Positive Impacts

- Increased economic activity;
- Improved and reliable power supply;
- Employment creation;
- Improved road infrastructure;
- Gender - Access to electricity would improve the quality of life and also reduce the time consumption of women for household activities which will entail availability of more time for other activities.
- Reduced consumption/ reliance of/ on fossil fuels like firewood, charcoal etc.;
- Capacity Building.

ii. Negative Impacts

- Loss of land;

- Restriction on land use;
- Temporary loss of access to Common Property Resources; and
- Health and Safety risk including HIV/AIDS.

Impacts - Environment

22 This section identifies the potential environmental impacts of the proposed projects. These impacts are both positive or negative relating to the project design stage, construction stage or the project operation and decommissioning stage.

i. Positive Impacts

- Availability of power lessen the demand of natural resources like firewood, charcoal etc. resulting in conservation/protection of forest/vegetation.

ii. Negative Impacts

- Clearance of tree within RoW;
- Impacts on forest, wildlife habitats and migratory birds;
- Impacts on drainage, soil erosion & water resources;
- Impacts on traffic and road infrastructure;
- Aesthetic appeal of area;
- Impacts from likely oil spillage;
- Effect of electromagnetic (EMF) fields;
- Leakage SF6; and
- Health & Safety

The potential E & S issues identified shall be managed within the applicable regulatory framework and international best practices.

Policy, Legal and Regulatory Framework

23 AEGCL/APDCL undertakes its Transmission/ Distribution system (33 kV and above) activities within the purview of Constitutional provisions, Policy, Legal, and Regulatory Framework for environmental and social issues applicable to power transmission & distribution. In addition, the requirements of multilateral funding agencies are also considered in the management procedures for addressing environmental and social issues.

24 The Constitution of India provides for protection of the environment and its improvement as a fundamental duty and the Directive Principles of State Policy under Article 51 A (g) and Article 48 A respectively. The Apex Court has widened the scope of Article 21 (Right to Life) bringing environmental impacts under its ambit. Similarly, the constitutional provisions in regard to social safeguards are enshrined in the Preamble to the Constitution, such as justice, social, economic and political; liberty of thought, expression, belief, faith and worship; equality of status and of opportunity; fraternity assuring the dignity of the individual and the unity and integrity of the Nation. Fundamental Rights and Directive Principles guarantee the right to life and liberty. Health, safety and livelihood been interpreted as part of this larger framework. The provisions on social safeguards are contained in Articles 14, 15, 17, 23, 24, 25, 46, 330, 332, etc.

25 **Sixth Schedule:** In addition to basic fundamental rights, special provisions have been extended to the Tribal Areas of State under the 6th Schedule [Articles 244(2) and 244(A)]. The Sixth Schedule provides for administration of certain tribal areas as autonomous entities. There are nine such autonomous regions which have been defined in the State of Assam. The administration of autonomous councils vested in a District Council and of an autonomous region, in a Regional Council. These Councils are endowed with legislative, judicial, executive and financial powers. Most Council consists of up to 30 members including few nominated members. These constitutionally mandated Councils oversee the traditional bodies of the local tribes. The functions of the autonomous council are:

- Allotment, occupation use or setting apart of land other than reserved forest for agriculture;
- Management of forest (which is not a reserved forest);
- Regulation of jhum cultivation or any other form s of shifting agriculture;
- Village or town administration including public health & sanitation.
- Inheritance of property
- Social customs

The Sixth Schedule envisages establishment of Autonomous Councils (ACs) and gives them elaborate Legislative, Administrative and Judicial powers. The district councils are also empowered to constitute Village councils and Village courts. The Sixth Schedule empowers the Governor to determine the administrative areas of the councils. He is authorized to create new autonomous districts, change the area of existing districts, redefine the boundaries and alter the names of autonomous districts. In case of Sixth Schedule areas the transfer of land from tribal to non-tribal is not allowed without the prior permission of the District Commissioner. The district council has been empowered to make laws pertaining to land and forest (other than reserve forest). The compensation for the damage to land,

property and forest would be governed by the provisions of the rules formulated by the District Councils.

26 **Environment :** Mandatory environmental requirements for AEGCL/APDCL at state level include: sanction of GoA under section 68(1) of the Electricity Act, 2003; Forest clearance under the Forest (Conservation) Act, 1980; During the currency of operations, Regulations on Batteries (Management and handling) Rules, 2001 regarding disposal of used batteries, Hazardous Wastes (Management, Handling and Transboundary Movement) Rules, 2008 regarding disposal of used transformer oil, Ozone Depleting Substances (Regulation and Control) Rules, 2000 putting restrictions on use of ozone depleting substances come into force and required voluntary enforcement and provisions under Biological Diversity Act, 2002, E-waste (Management and Handling) Rules, 2011 regarding maintaining records & handling of electronic wastes, the Scheduled Tribes & Other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006 and Assam Control of Tree Felling Rules, 2012.

27 The Forest (Conservation) Act, 1980 is the key legislation through which the environmental impacts of transmission projects are managed since the current regulation does not require an Environmental Impact Assessment for transmission lines. The legislation requires compensatory afforestation for any forest land diverted for non-forest use in twice the area diverted with afforestation undertaken by the respective state Forest Department. A national fund CAMPA has been created for this purpose. In case projects pass through or are located in designated protected areas, clearances from the Wildlife Board are also required. AEGCL/APDCL has decided to undertake assessment of environmental impacts even for cases where not statutorily mandated in order to confirm compliance with its own policy highlighted in paragraph 6 above.

28 **Social:** Mandatory Social requirements for AEGCL/APDCL at State level include provisions of section 67 & 68 (5 & 6) of the Electricity Act, 2003 for the calculation of compensation for any temporary damages. Involuntary land acquisitions, if any done, for securing private lands for construction of sub-stations, fall under the realm of The Right to Fair Compensation and Transparency in Land Acquisition Rehabilitation and Resettlement Act, 2013 (RFCTLARRA). The provisions of Indian Treasure Trove Act, 1878 as amended in 1949 covers chance finds. The Right to Information Act, 2005 (RTI) ensures citizens to access information under the control of public authorities.

29 **The World Bank** (WB) Operational Policies OP 4.01, 4.04, 4.11 & 4.36/ADB's Safeguard Policy Statement 2009 (SPS 2009) for Environmental and Social Considerations outline funding agencies policy and procedures for Environmental Assessment (EA) of different developmental projects. Depending upon the issues and impacts, the projects are categorized as A, B, and C warranting

larger and specialized focus for A and the least for C. This project, as per the WB guidelines, is categorized as A. Likewise, OP 4.10 and 4.12 outlines policy guidelines for managing issues related to tribal people and involuntary resettlement.

30 **RFCTLARRA, 2013** has replaced the old Land Acquisition Act, 1894 and has come into force from 1st January 2014. The new act i.e. RFCTLARRA, 2013 authorizes State Govt. (i.e. GoA) or its authorized Government agency to complete the whole process of acquisition of private land including Social Impact Assessment (SIA), Action Plan for R&R (i.e. Rehabilitation and Resettlement) & its implementation and the AEGCL/APDCL's responsibility is limited to identification and selection of suitable land based on technical requirement and ensuring budget allocation. Conducting Social Impact Assessments (SIA) has been made mandatory under this new act and results of these assessments are shared with all the stakeholders and public hearing held which makes the process transparent and informed. Subsequently, an entitlement package that includes both compensation (for land/structure and assets to land and structure) and R&R as necessary is prepared. Further to this, individual awards are passed and all documents are disclosed in the public domain through local administration and internet. The flow chart of the land acquisition process with schedule prescribed for various activities is illustrated in Figure 1 below. The entitlements with regard to compensation and assistances towards land acquisition or loss of any assets or livelihood for all categories of people being affected due to land acquisition is briefly outlined in Table 3:

Table 3: Compensation and R&R Entitlement Framework for Land Acquisition

A Comprehensive Compensation Package	
Eligibility for Entitlement	**Provisions**

The affected families • **Land Owners: includes any person-** i) whose name is recorded as (he owner of the land or building or part thereof, in the records of the authority concerned; or ii) any person who is granted forest rights under the Scheduled Tribes and Other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006 or under any other law for the time being in force; or iii) who is entitled to be granted Patta rights on the land under any law of the State including assigned lands: or iv) any person who has been declared as such by an order of the court or Authority;	**Determination of Compensation :** **1. Market value** of the land • as specified in the Indian Stamp Act, 1899 or • the average of the sale price for similar type of land situated in the village or vicinity, or • consented amount of compensation as agreed in case of acquisition of lands for private companies or for public private partnership project. **whichever is higher** Market value x **Multiplier* between 1 to 2 in rural areas only (No multiplier in urban areas).** **2.** Value of the assets attached to land: Building/Trees/Wells/Crop etc. as valued by relevant govt. authority; **Land compensation = 1+2** **3. Solatium:** 100% of total compensation **Total Compensation** : **1+2+3**

(*) Precise scale shall be determined by the State Govt.
The indicative values of multiplier factor based on distance from urban areas as provided in the act.

Radial Distance from Urban area (Km)	Multiplier Factor
0-10	1.00
10-20	1.20
20-30	1.40
30-40	1.80
40-50	2.00

B. R&R Package

Elements of Rehabilitation and Resettlement Entitlements for all the affected families (both land owners and the families whose livelihood is primarily dependent on land acquired) in addition to compensation provided above

Sl. No.	Elements of R& R Entitlements	Provision
1.	Subsistence grant/allowance for displaced families	Rs. 3000 per month per family for 12 months
2.	The affected families shall be entitled to:	a. Where jobs are created through the project, mandatory employment for one member per affected family; **or** b. Rupees 5 lakhs per family; **or**

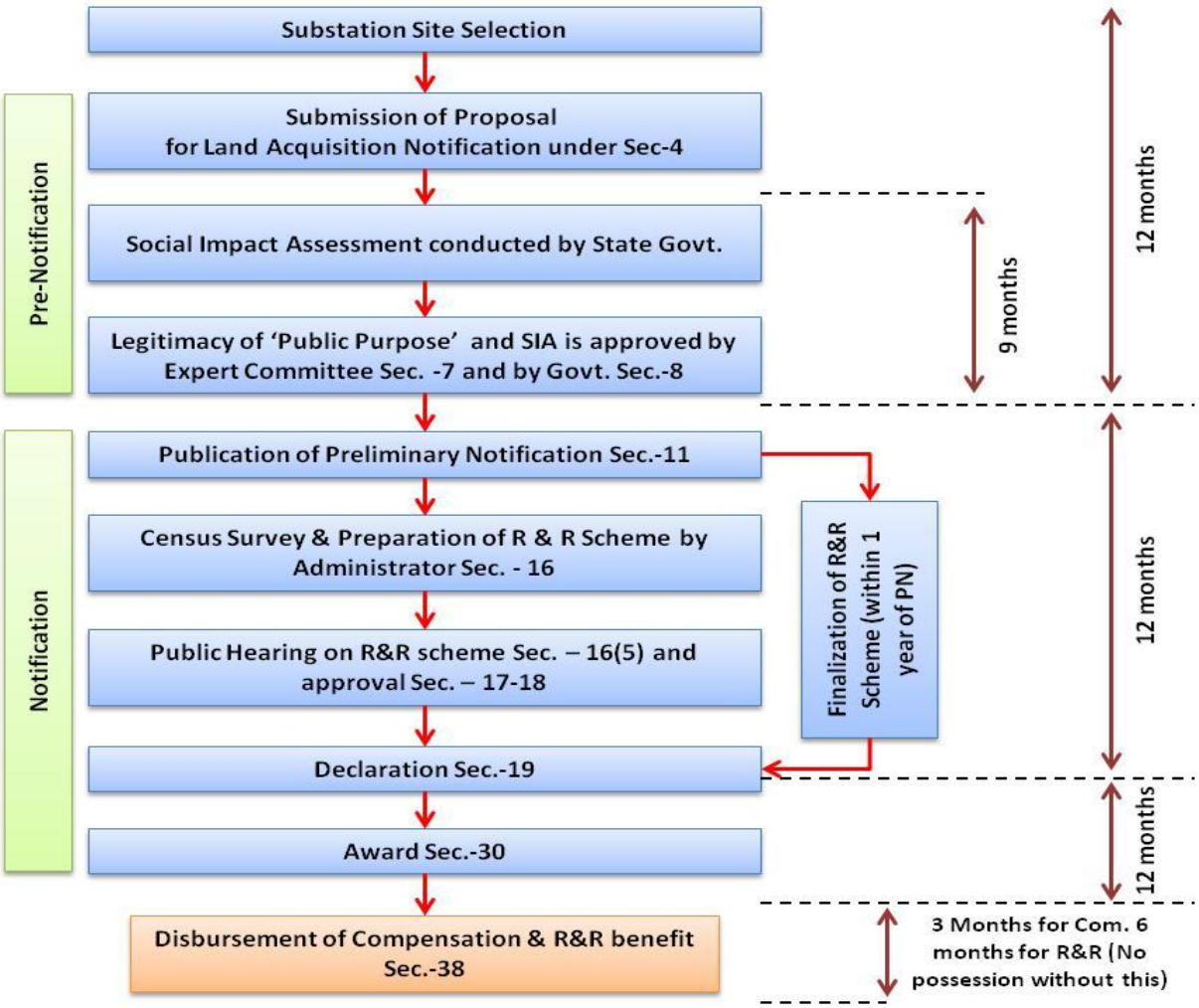
		c. Rupees 2000 per month per family as annuity for 20 years, with appropriate index for inflation; **The option of availing (a) or (b) or (c) shall be that of the affected family**
3.	Housing units for displacement: i) If a house is lost in rural areas: ii) If a house is lost in urban areas	i. A constructed house shall be provided as per the Indira Awas Yojana specifications. ii. A constructed house shall be provided, which will be not less than 50 sq. mts. in plinth area. In either case the equivalent cost of the house may also be provided in lieu of the house as per the preference of the project affected family. The stamp duty and other fees payable for registration of the house allotted to the affected families shall be borne by the Requiring Body.
4.	Transportation cost for displaced families	Rs 50,000/- per affected family
5.	Resettlement Allowance (for displaced families)	Onetime Rs 50,000/- per affected family
6.	Cattle shed/ petty shop cost	Onetime financial assistance as appropriate for construction as decided by St. Govt. subject to minimum of Rs.25,000/-
7.	Artisan/small traders/others (in case of displacement)	Onetime financial assistance as appropriate as decided by State Govt. subject to minimum of Rs.25,000/-

Special Provisions for SCs/STs

In addition to the R&R package, *SC/ST families will be entitled to the following additional benefits:*

1. One time financial assistance of Rs. 50,000 per family;
2. Families settled outside the district shall be entitled to an additional 25% R&R benefits;
3. Payment of one third of the compensation amount at very outset;
4. Preference in relocation and resettlement in area in same compact block;
5. Free land for community and social gatherings;
6. In case of displacement, a *Development Plan is to be prepared*
7. *Continuation of reservation and other Schedule V and Schedule VI area benefits from displaced area to resettlement area.*

Figure 1: Activity Chart RFCTLARRA, 2013



Project Cycle – Integrating Environment and Social Issues/ Concerns and Mitigatory Measures

31 Stakeholder analysis and impact assessments had enabled identifying issues. The same are now placed in the project cycle so as to draw management measures for addressing the same. Key milestones in AEGCL/APDCL's transmission/Distribution (33 kV and above) projects are;

i) Project Conceptualization
ii) Project Planning
iii) Approval
iv) Detailed Design and Tendering
v) Project Implementation
vi) Operation & Maintenance
vii) Review and Monitoring and Evaluation.

Environmental and Social Concerns

32 **Environmental Concerns.**

- Clearing/lopping of Trees within Right of Way (RoW);
- Clearing of Ground Vegetation for Movement of Machinery;
- Disposal of Used Transformer Oil;
- Disposal of Used Battery;
- Disposal of E-waste; and
- Leakage/use of SF_6 gas.

33 **Social Concerns**

- Loss to Standing Crop;
- Change in Land Prices;
- Temporary Loss of Access to Common Property Resources;
- Restriction on Land Use;
- Loss of livelihood due to acquisition of private agricultural land; and
- Loss of homestead, if any.

34 Management measures to address the issues and concerns in respect of social and environment are presented in Tables 4 and 5 respectively.

Table 4: Social Management Measures

Sl.	Potential Issues	Management Measures
1	Loss of land	For Tranche-1, this is an issue as land for only 15 transmission substations out of 36 transmission & distribution substations is available with the Utility (for details refer Table-5.4 in the main report). For remaining 5 transmission and 16 distribution substations, lands will have to be secured a fresh by AEGCL/APDCL through adopting any of the following three methods; i. Purchase of land on willing buyer & willing seller basis on negotiated rate; ii. Voluntary Donation; and iii. Involuntary Acquisition. In case of procurement of land through private purchase, AEGCL/APDCL shall ensure that compensation/rate for land is not less than the rate provided in the new land acquisition act, 2013. In order to comply with this provision AEGCL/APDCL may organize an awareness camp where provisions of new act in respect of

Sl.	Potential Issues	Management Measures
		basis/modalities of compensation calculation shall be explained to land owners with specific State provision if any. In the case of voluntary donation of land, the following shall be ensured: • The land user(s) will not be subjected to undue pressure for parting of land; • All out efforts shall be made to avoid any physical relocation/displacement due to loss of land; • The AEGCL/APDCL shall facilitate in extending 'gratitude' to the land donor(s) in lieu of the 'contribution' if so agreed. The same shall be documented in the shape of MoU between donor and utility and subsequently title of land transferred in the name of AEGCL/APDCL. • All land donations and direct purchases will be subject to a review/ approval by a broad based committee comprising representatives of different sections including those from the IA and GoA. In case of land acquired through involuntary acquisition, provisions of RFCTLARRA, 2013 shall be followed. (for details refer Part – A of Social Management Framework placed as Annexure – 3)
2	Change in land use and population relocation for substations	Due to inherent flexibility in locating substation and very small size of land, AEGCL/APDCL avoids habituated area completely hence no relocation of population on account of setting up of substation is envisaged.
		Although securing land for construction of substations proposed under tranche-1 is an issue, AEGCL/APDCL shall make all out efforts to secure such land wherein possibility of physical relocation/displacement is not envisaged.
3	Change in land use and population relocation due to towers/poles	As per existing law, land for tower/pole and right of way is not acquired and agricultural activities are allowed to continue after construction activity and AEGCL/APDCL pays compensation for all damages including cost of land below tower to its owner without acquiring it. Hence change in land use and resultant relocation of people is not envisaged in T&D projects.
4	Right of Way	Land for tower and right of way is not acquired as agricultural activities can continue. However, the project shall pay full compensation to all the affected persons/ community for any damages sustained during the execution of work. Accordingly, AEGCL/APDCL has formulated appropriate management plan in the form of Compensation Plan for Temporary Damage (CPTD) to minimize the damages and provide compensation plan for temporary damages in consultation with the state government and affected

Sl.	Potential Issues	Management Measures
		persons and/ or community (for details refer Part – B of Social Management Framework placed as Annexure – 3)
5	Impact on Tribals	The population of Assam as per census 2011 was 3,12,05,576. The Scheduled Tribes (STs) population is 38, 84,371 which constitutes 12.4 per cent of the total population of the State. In compliance with Bank's Operational Policy 4.10 (Indigenous Peoples) and special provision of RFCTLARRA, 2013, a Tribal People Development Framework has been prepared (refer Part - C of Social Management Framework placed as Annexure – 3)
6	Gender/ women participation	Women involvement will be planned through formal and informal group consultations so that their participation is ensured during preparation and implementation of the project.
7	Induced secondary development during construction	AEGCL/APDCL operations are short-lived and do not induce secondary developments during construction.
8	Health and safety of worker/employee/ community	During construction the health and safety aspects of workers and nearby community shall be implemented through contractors with due diligence and compliance of required regulation/guideline through a safety plan AEGCL/APDCL uses best available technology for lines and do not cause any hazards to health and safety.
9	"Chance finds" or discovery of any archaeological artifacts, treasure etc. during excavation	Possibilities of such phenomenon in T&D project are quite remote due to limited and shallow excavations. However, in case of such findings, AEGCL/APDCL will follow the laid down procedure in the Section-4 of Indian Treasure Trove Act, 1878 as amended in1949.
10	Inter Agency Coordination	Exclusive bodies will be set up at state/ district levels for over-seeing, reviewing and guiding the project

Table 5: Environment Management Measures

Sl. No	Potential Issues	Management Measures
1	Minimising adverse impact on forests	AEGCL/APDCL endeavors to circumvent / lessen environmentally sensitive areas such as forest and other ecologically fragile / sensitive areas through optimization of route including use of modern tools like GIS/GPS and other modern techniques.
2.	Clearing/Lopping of trees	Use of extended/special tower to reduce RoW and impact on trees
3.	▪ Vegetation damage ▪ Habited Loss	To minimise damage to vegetation and habitat fragmentation, AEGCL/APDCL utilises hand clearing and transportation of tower material by head loads into forestland and other land as well, wherever possible.

Sl. No	Potential Issues	Management Measures
4.	▪ Habitat fragmentation ▪ Edge effect on flora & fauna	AEGCL/APDCL maintains only a 3m wide strip for O&M and allows for regeneration of vegetation in the other one or two strips and beneath the transmission lines to avoid habitat fragmentation and edge effect. In hilly area this can possibly be totally avoided.
5.	Chances of accident involving elephant in the specified corridor due to placing of poles	APDCL shall try to avoid such area to the extent possible. However, in case avoidance is not possible, suitable design modification in the pole like provision of spike guards, barbed wire fencing or any other arrangement shall be incorporated in such location.
6.	Erosion of soil and drainage along the cut and fill slopes in hilly areas	AEGCL/APDCL would ensure that all cut and fill slopes in TL/DL are adequately protected using standard engineering practices including bio-engineering techniques wherever feasible. All drainage channels along or inside substations shall be trained and connected to main or existing drainage to avoid any erosion due to uncontrolled flow of water.
7.	Chemical contamination from chemical maintenance techniques	AEGCL/APDCL does not use chemicals for forest clearance/RoW maintenance
8.	Poly- Chloro-Biphenyls (PCBs) in electrical equipment	AEGCL/APDCL use mineral oil in electrical equipments. Specification of oil containing PCB less 2 mg/kg (non –detectable level) stated in the tender document
9.	Induced secondary development during construction	AEGCL/APDCL operations are short-lived and do not induce secondary developments during construction
10.	Avian hazards from transmission/distribution lines and towers	Avian hazards mostly encountered in bird sanctuaries area and fly path of migratory bird predominantly related to nesting site. Although the incidence of avian hazards is rare due to the distance between the conductors. AEGCL/APDCL shall take all possible precaution to avoid these areas by careful route selection. However, bird guards are provided to prevent any avian hazards.
11.	Air craft hazards from transmission lines and towers	AEGCL/APDCL as per the requirement of IS 5613 of July'94 provides aviation markers, night-lights for easy identification of towers in notified/selected areas.
12.	Health and safety of worker/employee/community	During construction the health and safety aspects of workers and nearby community shall be implemented through contractors with due diligence and compliance of required regulation/guideline through a safety plan. AEGCL/APDCL uses best available technology for lines and do not cause any hazards to health and safety.
13.	Fire Hazards	Fire hazards are mostly occurred in forest area. However, AEGCL/APDCL uses state of art automatic tripping mechanism for its transmission/distribution and substation that disconnect the line in fraction of seconds to prevent fire hazards. The Forest Department

Sl. No	Potential Issues	Management Measures
		also take precaution like maintaining fire line in the cleared forest area to avoid spread of fire
		Firefighting instruments including fire extinguishers are kept in appropriate place for immediate action in case of any fire hazard.
14.	Pollution	Although pollution is not an issue with transmission/ distribution projects still AEGCL/APDCL will make efforts to further minimise it. Sites are cleared of all the leftover materials and debris to avoid any chance of pollution.
15.	GHG (SF_6 Gas)	Although leakage of SF6 is not a major issue, AEGCL/APDCL will make efforts to reduce the leakage through regular monitoring installing gas pressure monitor/ leak detectors in Circuit Breakers.

35 Other potential environmental and social issues/ concerns and their management measures are described in an EMP, a sample of which is in the Annex-A to the summary. It will be implemented during the execution of the project. Since many provisions of the EMP are to be implemented by the Contractor, to ensure its proper implementation and monitoring, the EMP forms a part of the contract document.

AEGCL/APDCL's Environment and Social Management Procedures (ESPP)

36 AEGCL/APDCL's has developed comprehensive Environment and Social (E&S) management procedures and incorporated them to its project cycle, to ensure that its operation eliminates or minimizes adverse environmental and social impacts. The E&S management procedures identify the relevant issues at early stage of project cycle and follow the basic philosophy of sustainable development along with Principles of Avoidance, Minimization and Mitigation. These three guiding principles are employed in a project right from very beginning i.e. at the time of Project conceptualization & Planning Stage by studying different alternatives line routes for selection of most optimum route to avoid involvement of forests/ biodiversity/Eco-sensitive zone including animal/bird path, protected areas, human habitations etc. to the extent possible. If necessary/required, tall towers are also provided to avoid/minimize the impact. In case it becomes unavoidable due to terrain and line route passes through protected areas additional studies would be conducted by independent agencies to ascertain the impacts and to plan management measures to minimize/mitigate such impacts. A Terms of Reference (ToR), for such assessment, which can be customized for a particular situation/ location/ concern has been prepared and is placed at Annexure - 19 of the main report.

37 Likewise for substation land, AEGCL/APDCL identifies number of potential substation sites based on data collected as per the checklist (Annexure -16 of the main report) and a comprehensive

analysis for each alternative site is carried out. The analysis considers various site specific parameters that includes infrastructure facilities such as access roads, railheads, type of land viz. Govt., revenue, private land, agricultural land; social impacts such as number of families getting affected; and cost of compensation and rehabilitation giving due weightage to each. Environmental & Social Management process dovetailed in project cycle for appropriate and timely action is outlined in Figure 2.

Environmental and Social Risk assessment

38 Environmental and Social Risk Assessment is a vital part of AEGCL/APDCL's environmental and social management strategies. The risk assessment process identifies existing risks, and forecast future potential risks in its power transmission/distribution projects. It is a scientific process that includes cost benefit analysis. The environment and social management procedures developed by AEGCL/APDCL evaluate these risks, both qualitatively and quantitatively, and prioritise them. Based on prioritisation, environment and social management options are selected. AEGCL/APDCL's Risk Management process involves risk preparedness, risk mitigation and the sharing of liabilities (via internal arrangements and insurance).Responsibilities in the event of occurrence of a risk have been illustrated in Table 6.

Table 6: AEGCL/APDCL's Risk Responsibility Framework

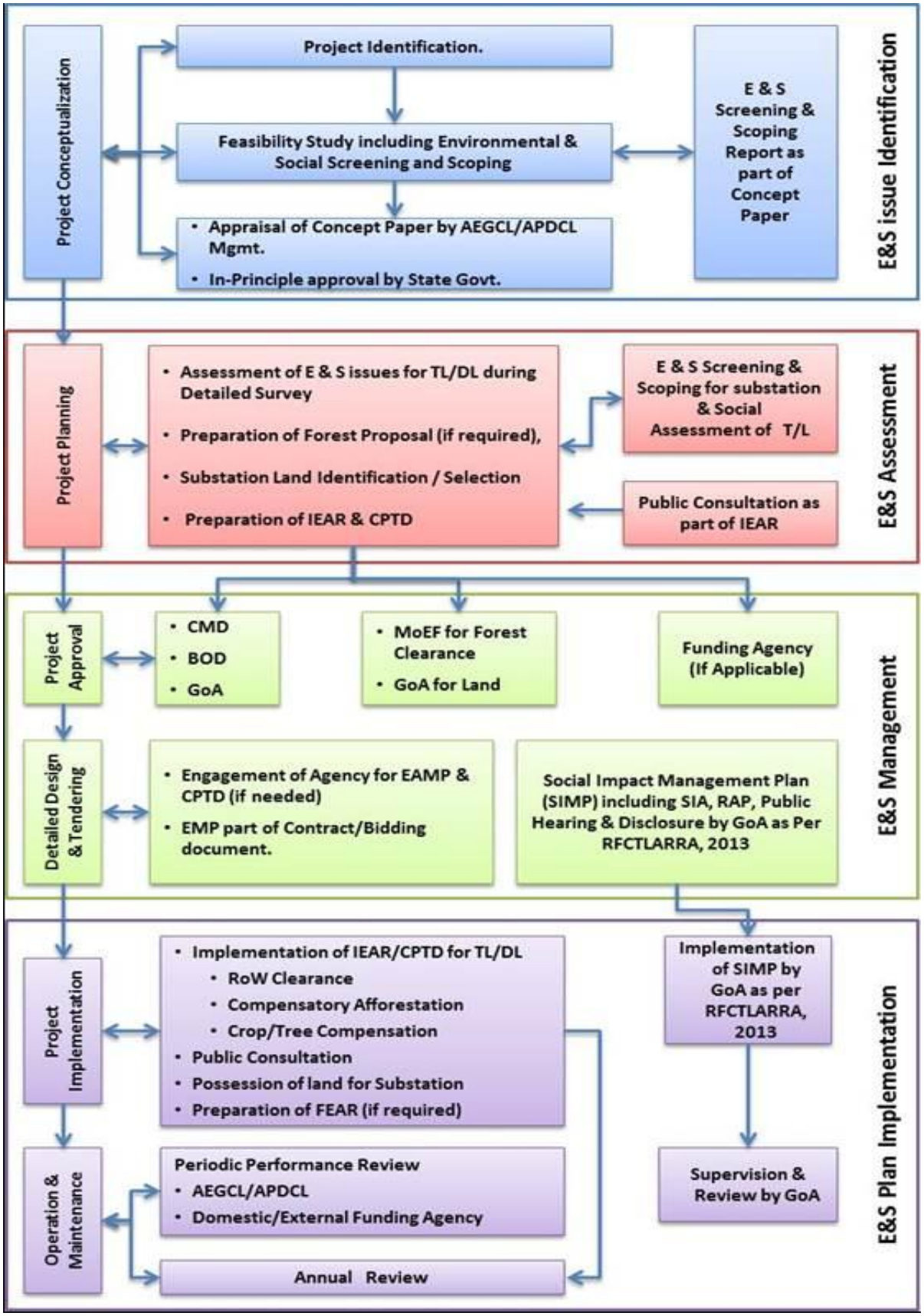
Risk	Key Role-players			
	GOA	*AEGCL/APDCL*	*Contractor*	*Insurers*
Non Compliance ➢ Regulatory[2] ➢ Contractual[3]	 ✓ -	 ✓ -	 ✓ ✓	 - -
Major hazards, e.g. tower fall during construction	-	✓	✓	✓
During O&M	-	✓	-	-
Impacts on health[4] etc.	-	✓	-	-
Force Majeure ➢ Insurable ➢ Non-Insurable	 - ✓	 - ✓	 - -	 ✓ -
Inclusion/ Exclusion of concerned Communities	✓	✓		
Public interest mitigation	✓	✓	-	-

[2] *Regulatory like working in forest/protected areas without statutory clearances.*

[3] *Contractual like noncompliance of condition of clearance like fuel supply to labourer to avoid tree felling, no-work during night times, etc.*

[4] *Impact of health like any case of prolonged exposure to Electro-Magnetic Field (EMF).*

Figure – 2: Environment and Social Management Procedures



Implementation Arrangements

39 To ensure quality and strengthen organizational systems to enable effective implementation of the ESPP, AEGCL/APDCL shall have to set out procedures and work culture which will promote total involvement of all its personnel. To attain assigned goal following shall be ensured:

a) A synchronized system of functioning adopted by Corporate Planning and Corporate Monitoring group, which monitors all activities in the organization;

b) An emphasis on intradepartmental approach to all projects, delineation of departmental responsibilities and the delegation and decentralization of authority resulting in a fast response and quick adjustment to change;

c) A commitment to provide at all times the best possible time bound quality service in all areas of its operations.

40 AEGCL/APDCL's commitment to the ESPP shall have to be developed with these principles. To ensure effective implementation of its ESPP, AEGCL/APDCL's will focus on;

- Strengthening the implementation of the ESPP by deployment of appropriately trained personnel at key levels;
- Reinforcing in-house capabilities by working with specialized external agencies;
- Placing dedicated manpower with specialization in the respective field to deal with and manage the environment and social issues;
- Reviewing progress of the ESPP internally or through external agencies.

41 Corporate office will have overall responsibility for construction, operation, and maintenance of transmission/distribution systems apart from providing necessary support services.

42 For the NERPSIP, the implementing agency (IA) is POWERGRID with its mandate for design and implementation supervision for the project. In consultations with the states, it has put up a tiered structure as follows:

- **Central Project Implementation Unit (CPIU)** - A body responsible for coordinating the preparation and implementation of the project and shall be housed within the IA's offices at Guwahati. The "Project-In-Charge" of IA & Head of each of the SPCU shall be a member of CPIU.

- **State Project Coordination Unit (SPCU)** – A body formed by the Utility and responsible for coordinating with IA in preparing and implementing the project at the State level. It consist of experts across different areas from the Utility and shall be headed by an officer of the rank not below Chief Engineer, from AEGCL/APDCL.
- **Project Implementation Unit (PIU)** – A body formed by the IA, including members of AEGCL/APDCL on deputation, and responsible for implementing the Project across the State, with its personnel being distributed over work site & working in close association with the SPCU/ CPIU. PIU report to State level "Project Manager" nominated by the Project-in-Charge of IA. The IA will have a Core team stationed at the CPIU on permanent basis and other IA officers (with required skills) will visit as and when required by this core team.

Grievance Redressal Mechanism (GRM)

43 Grievance Redress Mechanism (GRM) is an integral and important mechanism for addressing/resolving the concern and grievances in a transparent and swift manner. Many minor concerns of peoples are addressed during public consultation process initiated at the beginning of the project and broadly outlined in Annexure-23. For handling grievance, AEGCL/APDCL has already a framework in place. To ensure its implementation, Grievance Redress Committee (GRC) will be established at two places, one at the project/scheme level and another at Corporate/HQ level. The GRCs shall include members from AEGCL/APDCL, Local Administration, Village Panchayat Members, Affected Persons representative and reputed persons from the society and representative from the autonomous districts council in case of tribal districts selected/decided on nomination basis under the chairmanship of project head. The composition of GRC shall be disclosed in Panchayat office and concerned district headquarter for wider coverage.

44 The complainant will also be allowed to submit its complaint to local project official who will pass it to GRC immediately but not more than 5 days of receiving such complaint. The first meeting of GRC will be organized within 15 days of its constitution/disclosure to formulate procedure and frequency of meeting. However, GRC meeting shall be convened within 15 days of receiving a grievance for its solution. GRC endeavor will be to pronounce its decision/ may also refer it to corporate GRC for solution within 30-45 days of receiving grievances. In case complainant/appellant is not satisfied with the decision of GRC they can approach AEGCL/APDCL Corporate level Committee /District Collector or Court of law for solution.

45 The corporate level GRC shall function under the chairmanship of Director (PMU) who will nominate other members of GRC including one representative from corporate ESMC who is conversant with the environment & social issues. The meeting of Corporate GRC shall be convened within 7-10

days of receiving the reference from project GRC or complainant directly and pronounce its decision within next 15 days.

46 These GRCs shall act as supplement and in no way substitute the legal systems, especially embedded within RFCTLARR Act 2013, The Electricity Act, 2003, and Right to Information Act.

Monitoring & Evaluation

47 For environmental and social components of a project, environmental and social monitoring plan is developed, based on baseline data and impacts predicted during the environmental and social assessment process. The concerned forest department staffs, as part of their duties monitor impacts on ecological resources through which the transmission line traverses. AEGCL/APDCL in coordination with forest/revenue officials will monitor timely implementation of various activities such as compensatory afforestation, ROW maintenance, prevention of fire hazards, natural regeneration of vegetation etc. The environmental and social monitoring plan for each project will be integrated with construction, operation and maintenance and shall be monitored by the ESMC on a monthly basis.

48 Since regular and effective monitoring of implementation of EAMP/CPTD for Transmission/Distribution Line and SIMP for substations are crucial for desired result, AEGCL/APDCL shall designate one Manager each for Environment and Social related aspects who will be made responsible for all the activities related to implementation/monitoring of the EAMP and CPTD. Participation of PAPs in the monitoring of EAMP/CPTD/SIMP is also ensured through regular consultation and their active participation. Major monitoring indicator identified for regular monitoring of activities will be carried out by different department at field and will be reviewed by the Nodal Officer (ESMC) on monthly basis. CMD will review ongoing activities on quarterly including environment and social issues and corrective measures if required are implemented at site.

Annex-A: Sample Environmental Management Plan

Clause No.	Project activity/ stage	Potential impact	Proposed mitigation measures	Parameter to be monitored	Measurement & frequency	Institutional responsibility	Implementation schedule
Pre-construction							
1	Location of overhead line towers/ poles/ underground distribution lines and alignment & design	Exposure to safety related risks	Setback of dwellings to overhead line route designed in accordance with permitted level of power frequency and the regulation of supervision at sites.	Tower location and overhead/ underground alignment selection with respect to nearest dwellings	Setback distances to nearest houses – once	Implementing Agency (IA)	Part of overhead lines tower/poles/ laying of underground cable sitting survey and detailed alignment survey and design
2	Equipment specifications and design parameters	Release of chemicals and gases in receptors (air, water, land)	PCBs not used in substation transformers or other project facilities or equipment.	Transformer design	Exclusion of PCBs in transformers stated in tender specification – once	IA	Part of tender specifications for the equipment
			Processes, equipment and systems not to use chlorofluorocarbons (CFCs), including halon, and their use, if any, in existing processes and systems should be phased out and to be disposed of in a manner consistent with the requirements of the Government	Process, equipment and system design	Exclusion of CFCs stated in tender specification – once	IA	Part of tender specifications for the equipment
					Phase out schedule to be prepared in case still in use – once		Part of equipment and process design
3	Transmission/ Distribution line design	Exposure to electromagnetic interference	Line design to comply with the limits of electromagnetic interference from overhead power lines	Electromagnetic field strength for proposed line design	Line design compliance with relevant standards – once	IA	Part of design parameters

Clause No.	Project activity/ stage	Potential impact	Proposed mitigation measures	Parameter to be monitored	Measurement & frequency	Institutional responsibility	Implementation schedule
4	Substation location and design	Exposure to noise	Design of plant enclosures to comply with noise regulations.	Expected noise emissions based on substation design	Compliance with regulations - once	IA	Part of detailed siting survey and design
		Social inequities	Careful selection of site to avoid encroachment of socially, culturally and archaeological sensitive areas (i.e. sacred groves, graveyard, religious worship place, monuments etc.)	Selection of substation location (distance to sensitive area).	Consultation with local authorities/ autonomous councils -once		Part of detailed siting survey and design
5	Location of overhead line towers/poles/ laying of underground distribution line & alignment and design	Impact on water bodies	Avoidance of such water bodies to the extent possible. Avoidance of placement of tower inside water bodies to the extent of possible	Tower/pole location and overhead/ underground line alignment selection (distance to water bodies)	Consultation with local authorities– once	IA	Part of tower/pole sitting survey and detailed underground /overhead line alignment survey and design
		Social inequities	Careful route selection to avoid existing settlements and sensitive locations	Tower/pole location and overhead/ underground line alignment selection (distance to nearest dwellings or social institutions)	Consultation with local authorities/ autonomous councils and land owners – once	IA	Part of detailed tower/pole sitting and overhead/underground alignment survey and design
			Minimise impact on agricultural land	Tower location and overhead/ underground line alignment selection (distance to agricultural land)	Consultation with local authorities/ autonomous councils and land owners – once		

Clause No.	Project activity/ stage	Potential impact	Proposed mitigation measures	Parameter to be monitored	Measurement & frequency	Institutional responsibility	Implementation schedule
			Careful selection of site and route alignment to avoid encroachment of socially, culturally and archaeological sensitive areas (i. g. sacred groves, graveyard, religious worship place, monuments etc.)	Tower/pole location and overhead/ underground line alignment selection (distance to sensitive area)	Consultation with local authorities/ autonomous councils -once		
6	Securing lands for substations.	Loss of land/ income change in social status etc.	In the case of Involuntary Acquisitions, Compensation and R&R measures are extended as per provision of RFCTLARRA, 2013	Compensation and monetary R&R amounts/ facilities extended before possession of land.	As per provisions laid out in the act	State Govt.	Prior to award/start of substation construction.
7	Line through protected area/ precious ecological area	Loss of precious ecological values/ damage to precious species	Avoid siting of lines through such areas by careful site and alignment selection (National Parks, Wildlife Sanctuary, Biosphere Reserves/ Biodiversity Hotspots)	Tower/pole location and overhead/ underground line alignment selection (distance to nearest designated ecological protected/ sensitive areas)	Consultation with local forest authorities - once	IA	Part of detailed siting and alignment survey /design
			Minimize the need by using RoW wherever possible	Tower/pole location and overhead/ underground line alignment selection	Consultation with local authorities and design engineers - once	IA	Part of detailed sitting and alignment survey /design
8	Line through identified Elephant corridor / Migratory bird	Damage to the Wildlife/ Birds and also to line	Study of earmarked elephant corridors to avoid such corridors, Adequate ground clearance, Fault clearing by Circuit Breaker, Barbed wire wrapping on towers, reduced spans etc., if applicable	Tower/pole location and overhead/ underground line alignment selection. Minimum/maximum ground clearance	Consultation with local forest authorities – once. Monitoring – quarterly basis	IA	Part of detailed sitting and alignment survey /design and Operation

Clause No.	Project activity/ stage	Potential impact	Proposed mitigation measures	Parameter to be monitored	Measurement & frequency	Institutional responsibility	Implementation schedule
			Avoidance of established/ identified migration path (Birds & Bats). Provision of flight diverter/ reflectors, bird guard, elevated perches, insulating jumper loops, obstructive perch deterrents, raptor hoods etc[5]., if applicable	Tower/pole location and overhead/ underground line alignment selection	Consultation with local forest authorities - once	IA	Part of detailed sitting and alignment survey /design and Operation
9	Line through forestland	Deforestation and loss of biodiversity edge effect	Avoid locating lines in forest land by careful site and alignment selection	Tower/pole location and overhead/ underground line alignment selection (distance to nearest protected or reserved forest)	Consultation with local authorities – once	IA	Part of detailed sitting and alignment survey/design
			Minimise the need by using existing towers, tall towers and RoW, wherever possible		Consultation with local authorities and design engineers – once		
			Measures to avoid invasion of alien species	Intrusion of invasive species	Consultation with local forest authorities - once		
			Obtain statutory clearances from the Government	Statutory approvals from Government	Compliance with regulations – once for each subproject		
			Consultation with autonomous councils wherever required	Permission/ NOC from autonomous councils	Consultation with autonomous councils – once during tower placement		

[5] As per International/National best practices and in consultation with concerned forest/wildlife Authority.

Clause No.	Project activity/ stage	Potential impact	Proposed mitigation measures	Parameter to be monitored	Measurement & frequency	Institutional responsibility	Implementation schedule
10	Lines through farmland	Loss of agricultural production/ change in cropping pattern	Use existing tower or footings wherever possible.	Tower/pole location and overhead/ underground line alignment selection.	Consultation with local authorities and design engineers – once	IA	Part of detailed alignment survey and design
			Avoid sitting new towers on farmland wherever feasible	Tower/pole location and overhead/ underground line alignment selection	Consultation with local authorities and design engineers – once		Part of detailed sitting and alignment survey /design
11	Noise related	Nuisance to neighbouring properties	Substations sited and designed to ensure noise will not be a nuisance	Noise levels	Noise levels to be specified in tender documents – once	IA	Part of detailed equipment design
12	Interference with drainage patterns/ irrigation channels	Flooding hazards/ loss of agricultural production	Appropriate sitting of towers to avoid channel interference	Tower/pole location and overhead/ underground line alignment selection (distance to nearest flood zone)	Consultation with local authorities and design engineers – once	IA	Part of detailed alignment survey and design
13	Escape of polluting materials	Environmental pollution	Transformers designed with oil spill containment systems, and purpose-built oil, lubricant and fuel storage system, complete with spill clean up equipment.	Equipment specifications with respect to potential pollutants	Tender document to mention specifications – once	IA	Part of detailed equipment design /drawings
			Substations to include drainage and sewage disposal systems to avoid offsite land and water pollution.	Substation sewage design	Tender document to mention detailed specifications – once	IA	Part of detailed substation layout and design /drawings

Clause No.	Project activity/ stage	Potential impact	Proposed mitigation measures	Parameter to be monitored	Measurement & frequency	Institutional responsibility	Implementation schedule
14	Equipments submerged under flood	Contamination of receptors	Substations constructed above the high flood level(HFL) by raising the foundation pad	Substation design to account for HFL (elevation with respect to HFL elevation)	Base height as per flood design- once	IA	Part of detailed substation layout and design /drawings
15	Explosions /Fire	Hazards to life	Design of substations to include modern fire fighting equipment Provision of fire fighting equipment to be located close to transformers	Substation design compliance with fire prevention and control codes	Tender document to mention detailed specifications – once	IA	Part of detailed substation layout and design /drawings
Construction							
16	Equipment layout and installation	Noise and vibrations	Construction techniques and machinery selection seeking to minimize ground disturbance.	Construction techniques and machinery	Construction techniques and machinery creating minimal ground disturbance- once at the start of each construction phase	IA (Contractor through contract provisions)	Construction period
17	Physical construction	Disturbed farming activity	Construction activities on cropping land timed to avoid disturbance of field crops (within one month of harvest wherever possible).	Timing of start of construction	Crop disturbance –Post harvest as soon as possible but before next crop – once per site	IA (Contractor through contract provisions)	Construction period
18	Mechanized construction	Noise, vibration and operator safety, efficient operation	Construction equipment to be well maintained.	Construction equipment – estimated noise emissions	Complaints received by local authorities – every 2 weeks	IA (Contractor through contract provisions)	Construction period

Clause No.	Project activity/ stage	Potential impact	Proposed mitigation measures	Parameter to be monitored	Measurement & frequency	Institutional responsibility	Implementation schedule
		Noise, vibration, equipment wear and tear	Turning off plant not in use.	Construction equipment – estimated noise emissions and operating schedules	Complaints received by local authorities – every 2 weeks	IA (Contractor through contract provisions)	Construction period
19	Construction of roads for accessibility	Increase in airborne dust particles	Existing roads and tracks used for construction and maintenance access to the line wherever possible.	Access roads, routes (length and width of new access roads to be constructed)	Use of established roads wherever possible – every 2 weeks	IA (Contractor through contract	Construction period
		Increased land requirement for temporary accessibility	New access ways restricted to a single carriageway width within the RoW.	Access width (meters)	Access restricted to single carriage –way width within RoW – every 2 weeks	IA (Contractor through contract provisions)	Construction period
20	Construction activities	Safety of local villagers	Coordination with local communities for construction schedules, Barricading the construction area and spreading awareness among locals	Periodic and regular reporting /supervision of safety arrangement	No. of incidents- once every week	IA (Contractor through contract provisions)	Construction period
		Local traffic obstruction	Coordination with local authority/ requisite permission for smooth flow of traffic	Traffic flow (Interruption of traffic)	Frequency (time span)- on daily basis	IA (Contractor through contract provisions)	Construction period
21	Temporary blockage of utilities	Overflows, reduced discharge	Measure in place to avoid dumping of fill materials in sensitive drainage area	Temporary fill placement (m^3)	Absence of fill in sensitive drainage areas – every 4 weeks	IA (Contractor through contract provisions)	Construction period
22	Site clearance	Vegetation	Marking of vegetation to be removed prior to clearance, and		Clearance strictly limited to target	IA	Construction period

Clause No.	Project activity/ stage	Potential impact	Proposed mitigation measures	Parameter to be monitored	Measurement & frequency	Institutional responsibility	Implementation schedule
			strict control on clearing activities to ensure minimal clearance.	Vegetation marking and clearance control (area in m^2)	vegetation – every 2 weeks	(Contractor through contract provisions)	
			No use of herbicides and pesticides				
23	Trimming /cutting of trees within RoW	Fire hazards	Trees allowed growing up to a height within the RoW by maintaining adequate clearance between the top of tree and the conductor as per the regulations.	Species-specific tree retention as approved by statutory authorities (average and max. tree height at maturity, in meters)	Presence of target species in RoW following vegetation clearance – once per site	IA (Contractor through contract provisions)	Construction period
		Loss of vegetation and deforestation	Trees that can survive pruning to comply should be pruned instead of cleared.	Species-specific tree retention as approved by statutory authorities	Presence of target species in RoW following vegetation clearance - once	IA (Contractor through contract provisions)	Construction period
			Felled trees and other cleared or pruned vegetation to be disposed of as authorized by the statutory bodies.	Disposal of cleared vegetation as approved by the statutory authorities (area cleared in m^2)	Use or intended use of vegetation as approved by the statutory authorities – once per site	IA (Contractor through contract provisions)	Construction period
24	Wood/ vegetation harvesting	Loss of vegetation and deforestation	Construction workers prohibited from harvesting wood in the project area during their employment, (apart from locally employed staff continuing current legal activities)	Illegal wood /vegetation harvesting (area in m^2, number of incidents reported)	Complaints by local people or other evidence of illegal harvesting – every 2 weeks	IA (Contractor through contract provisions)	Construction period
25	Surplus earthwork/soil	Runoff to cause water pollution, solid waste disposal	Soil excavated from tower footings/ substation foundation disposed of by placement along roadsides, or at	Soil disposal locations and volume (m^3)	Acceptable soil disposal sites – every 2 weeks	IA (Contractor through	Construction period

Clause No.	Project activity/ stage	Potential impact	Proposed mitigation measures	Parameter to be monitored	Measurement & frequency	Institutional responsibility	Implementation schedule
			nearby house blocks if requested by landowners			contract provisions)	
26	Substation construction	Loss of soil	Loss of soil is not a major issue as excavated soil will be mostly reused for filling. However, in case of requirement of excess soil the same will be met from existing quarry or through deep excavation of existing pond or other nearby barren land with agreement of local communities	Borrow area sitting (area of site in m^2 and estimated volume in m^3)	Acceptable soil borrow areas that provide a benefit - every 2 weeks	IA (Contractor through contract provisions)	Construction period
		Water pollution	Construction activities involving significant ground disturbance (i.e. substation land forming) not undertaken during the monsoon season	Seasonal start and finish of major earthworks(P^H, BOD /COD, Suspended solids, others)	Timing of major disturbance activities –prior to start of construction activities	IA (Contractor through contract provisions)	Construction period
27	Site clearance	Vegetation	Tree clearances for easement establishment to only involve cutting trees off at ground level or pruning as appropriate, with tree stumps and roots left in place and ground cover left undisturbed	Ground disturbance during vegetation clearance (area, m^2)	Amount of ground disturbance – every 2 weeks	IA (Contractor through contract provisions)	Construction period
				Statutory approvals	Statutory approvals for tree clearances – once for each site		
28	Substation foundation/Tower erection disposal of surplus earthwork/fill	Waste disposal	Excess fill from substation/tower foundation excavation disposed of next to roads or around houses, in agreement with the local community or landowner.	Location and amount (m^3)of fill disposal	Appropriate fill disposal locations – every 2 weeks	IA (Contractor through contract provisions)	Construction period

Clause No.	Project activity/ stage	Potential impact	Proposed mitigation measures	Parameter to be monitored	Measurement & frequency	Institutional responsibility	Implementation schedule
29	Storage of chemicals and materials	Contamination of receptors (land, water, air)	Fuel and other hazardous materials securely stored above high flood level.	Location of hazardous material storage; spill reports (type of material spilled, amount (kg or m^3) and action taken to control and clean up spill)	Fuel storage in appropriate locations and receptacles – every 2 weeks	IA (Contractor through contract provisions)	Construction period
30	Construction schedules	Noise nuisance to neighbouring properties	Construction activities only undertaken during the day and local communities informed of the construction schedule.	Timing of construction (noise emissions, [dB(A)]	Daytime construction only – every 2 weeks	IA (Contractor through contract provisions)	Construction period
31	Provision of facilities for construction workers	Contamination of receptors (land, water, air)	Construction workforce facilities to include proper sanitation, water supply and waste disposal facilities.	Amenities for Workforce facilities	Presence of proper sanitation, water supply and waste disposal facilities – once each new facility	IA (Contractor through contract provisions)	Construction period
32	Influx of migratory workers	Conflict with local population to share local resources	Using local workers for appropriate asks	Avoidance/reduction of conflict through enhancement/ augmentation of resource requirements	Observation & supervision–on weekly basis	IA (Contractor through contract provisions)	Construction period
33	Lines through farmland	Loss of agricultural productivity	Use existing access roads wherever possible	Usage of existing utilities	Complaints received by local people /authorities - every 4 weeks	IA (Contractor through contract provisions)	Construction period
			Ensure existing irrigation facilities are maintained in working condition	Status of existing facilities			

Clause No.	Project activity/ stage	Potential impact	Proposed mitigation measures	Parameter to be monitored	Measurement & frequency	Institutional responsibility	Implementation schedule
			Protect /preserve topsoil and reinstate after construction completed	Status of facilities (earthwork in m^3)			
			Repair /reinstate damaged bunds etc after construction completed	Status of facilities (earthwork in m^3)			
		Loss of income.	Land owners/ farmers compensated for any temporary loss of productive land as per existing regulation.	Process of Crop/tree compensation in consultation with forest dept.(for timber yielding tree) and Horticulture deptt.(for fruit bearing tree)	Consultation with affected land owner prior to implementation and during execution.	IA	During construction
34	Uncontrolled erosion/silt runoff	Soil loss, downstream siltation	Need for access tracks minimised, use of existing roads.	Design basis and construction procedures (suspended solids in receiving waters; area re-vegetated in m^2; amount of bunds constructed [length in meter, area in m^2, or volume in m^3])	Incorporating good design and construction management practices – once for each site	IA (Contractor through contract provisions)	Construction period
			Limit site clearing to work areas				
			Regeneration of vegetation to stabilise works areas on completion (where applicable)				
			Avoidance of excavation in wet season				
			Water courses protected from siltation through use of bunds and sediment ponds				
35	Nuisance to nearby properties	Losses to neighbouring land uses/ values	Contract clauses specifying careful construction practices.	Contract clauses	Incorporating good construction	IA (Contractor through	Construction period
			As much as possible existing access ways will be used	Design basis and layout	Incorporating good design		

Clause No.	Project activity/ stage	Potential impact	Proposed mitigation measures	Parameter to be monitored	Measurement & frequency	Institutional responsibility	Implementation schedule
			Productive land will be reinstated following completion of construction	Reinstatement of land status (area affected, m^2)	Consultation with affected parties – twice –	contract provisions)	
		Social inequities	Compensation will be paid for loss of production, if any.	Implementation of Tree/Crop compensation (amount paid)	Consultation with affected parties – once in a quarter	IA	Prior to construction
36	Flooding hazards due to construction impediments of natural drainage	Flooding and loss of soils, contamination of receptors (land, water)	Avoid natural drainage pattern/ facilities being disturbed/blocked/ diverted by on-going construction activities	Contract clauses (e.g. suspended solids and BOD/COD in receiving water)	Incorporating good construction management practices-once for each site	IA (Contractor through contract provisions)	Construction period
37	Equipment submerged under flood	Contamination of receptors (land, water)	Equipment stored at secure place above the high flood level(HFL)	Store room level to be above HFL (elevation difference in meters)	Store room level as per flood design-once	IA	Construction period
38	Inadequate siting of borrow areas (quarry areas)	Loss of land values	Existing borrow sites will be used to source aggregates, therefore, no need to develop new sources of aggregates	Contract clauses	Incorporating good construction management practices – once for each site	IA (Contractor through contract provisions)	Construction period
39	Health and safety	Injury and sickness of workers and members of the public	Safety equipment's (PPEs) for construction workers	Contract clauses (number of incidents and total lost-work days caused by injuries and sickness)	Contract clauses compliance – once every quarter	IA (Contractor through contract provisions)	Construction period
			Contract provisions specifying minimum requirements for construction camps				
			Contractor to prepare and implement a health and safety plan.				
			Contractor to arrange for health and safety training sessions				

Clause No.	Project activity/ stage	Potential impact	Proposed mitigation measures	Parameter to be monitored	Measurement & frequency	Institutional responsibility	Implementation schedule
40	Inadequate construction stage monitoring	Likely to maximise damages	Training of environmental monitoring personnel	Training schedules	No. of programs attended by each person – once a year	IA	Routinely throughout construction period
			Implementation of effective environmental monitoring and reporting system using checklist of all contractual environmental requirements	Respective contract checklists and remedial actions taken thereof.	Submission of duly completed checklists of all contracts for each site - once		
			Appropriate contact clauses to ensure satisfactory implementation of contractual environmental mitigation measures.	Compliance report related to environmental aspects for the contract	Submission of duly completed compliance report for each contract – once		
Operation and Maintenance							
41	Location of line towers/poles and overhead/ underground line alignment & design	Exposure to safety related risks	Setback of dwellings to overhead line route designed in accordance with permitted level of power frequency and the regulation of supervision at sites.	Compliance with setback distances ("as-built" diagrams)	Setback distances to nearest houses – once in quarter	AEGCL/ APDCL	During operations
42	Line through identified bird flyways, migratory path	Injury/ mortality to birds, bats etc due to collision and electrocution	Avoidance of established/identified migration path (Birds & Bats). Provision of flight diverter/reflectors, elevated perches, insulating jumper loops, obstructive perch deterrents, raptor hoods etc., if applicable	Regular monitoring for any incident of injury/mortality	No. of incidents- once every month	AEGCL/ APDCL	Part of detailed siting and alignment survey /design and Operation
43	Equipment submerged under flood	Contamination of receptors (land, water)	Equipment installed above the high flood level (HFL) by raising the foundation pad.	Substation design to account for HFL ("as-built" diagrams)	Base height as per flood design – once	AEGCL/ APDCL	During operations

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44	Oil spillage	Contamination of land/nearby water bodies	Substation transformers located within secure and impervious sump areas with a storage capacity of at least 100% of the capacity of oil in transformers and associated reserve tanks.	Substation bunding (Oil sump) ("as-built" diagrams)	Bunding (Oil sump) capacity and permeability - once	AEGCL/ APDCL	During operations
45	SF_6 management	Emission of most potent GHG causing climate change	Reduction of SF6 emission through awareness, replacement of old seals, proper handling & storage by controlled inventory and use, enhance recovery and applying new technologies to reduce leakage	Leakage and gas density/level	Continuous monitoring	AEGCL/ APDCL	During Operations
46	Inadequate provision of staff/workers health and safety during operations	Injury and sickness of staff /workers	Careful design using appropriate technologies to minimise hazards	Usage of appropriate technologies (lost work days due to illness and injuries)	Preparedness level for using these technologies in crisis – once each year	AEGCL/ APDCL	Design and operation
			Safety awareness raising for staff.	Training/awareness programs and mock drills	Number of programs and percent of staff /workers covered – once each year		
			Preparation of fire emergency action plan and training given to staff on implementing emergency action plan				
			Provide adequate sanitation and water supply facilities	Provision of facilities	Complaints received from staff /workers		
47	Electric Shock Hazards	Injury/ mortality to staff and public	Careful design using appropriate technologies to minimise hazards	Usage of appropriate technologies (number of injury incidents, lost work days)	Preparedness level for using these technology in crisis – once a month	AEGCL/ APDCL	Design and Operation

Clause No.	Project activity/ stage	Potential impact	Proposed mitigation measures	Parameter to be monitored	Measurement & frequency	Institutional responsibility	Implementation schedule
			Security fences around substations	Maintenance of fences	Report on maintenance – every 2 weeks		
			Barriers to prevent climbing on/ dismantling of transmission towers	Maintenance of barriers			
			Appropriate warning signs on facilities	Maintenance of warning signs			
			Electricity safety awareness raising in project areas	Training /awareness programs and mock drills for all concerned parties	Number of programs and percent of total persons covered – once each year		
48	Operations and maintenance staff skills less than acceptable	Unnecessary environmental losses of various types	Adequate training in O&M to all relevant staff of substations & transmission/ distribution line maintenance crews.	Training/awareness programs and mock drills for all relevant staff	Number of programs and percent of staff covered – once each year	AEGCL/ APDCL	Operation
			Preparation and training in the use of O&M manuals and standard operating practices				
49	Inadequate periodic environmental monitoring.	Diminished ecological and social values.	Staff to receive training in environmental monitoring of project operations and maintenance activities.	Training/awareness programs and mock drills for all relevant staff	Number of programs and percent of staff covered – once each year	AEGCL/ APDCL	Operation
50	Equipment specifications and design parameters	Release of chemicals and gases in receptors (air, water, land)	Processes, equipment and systems using chlorofluorocarbons (CFCs), including halon, should be phased out and to be disposed of in a manner consistent with the requirements of the Govt.	Process, equipment and system design	Phase out schedule to be prepared in case still in use – once in a quarter	AEGCL/ APDCL	Operations

Clause No.	Project activity/ stage	Potential impact	Proposed mitigation measures	Parameter to be monitored	Measurement & frequency	Institutional responsibility	Implementation schedule
51	Transmission/ distribution line maintenance	Exposure to electromagnetic interference	Transmission/ distribution line design to comply with the limits of electromagnetic interference from overhead power lines	Required ground clearance (meters)	Ground clearance -once	AEGCL/ APDCL	Operations
52	Uncontrolled growth of vegetation	Fire hazard due to growth of tree/shrub /bamboo along RoW	Periodic pruning of vegetation to maintain requisite electrical clearance. No use of herbicides/ pesticides	Requisite clearance (meters)	Assessment in consultation with forest authorities - once a year(pre-monsoon/post-monsoon	AEGCL/ APDCL	Operations
53	Noise related	Nuisance to neighbouring properties	Substations sited and designed to ensure noise will not be a nuisance.	Noise levels {dB(A)}	Noise levels at boundary nearest to properties and consultation with affected parties if any - once	AEGCL/ APDCL	Operations